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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,854

09/30/2005

Zenon Lysenko

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THE DOW CHEMICAL COMPANY  
INTELLECTUAL PROPERTY SECTION, P. O. BOX 1967  
MIDLAND, MI 48641-1967

EXAMINER

CUTLIFF, YATE KAI RENE

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,854	<b>Applicant(s)</b> LYSENKO ET AL.	
	<b>Examiner</b> Yate' K. Cutliff	<b>Art Unit</b> 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 1-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/08/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

1. Applicant's election without traverse of Group II, claims 18-34 in the reply filed on August 29, 2007 is acknowledged.

Claims 1-17 are withdrawn from consideration.

Claims 18 – 34 are under examination.

***Specification***

2. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 18 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Early et al. (U.S. 3,674,718), and in view of Voss et al. (U.S. 4,189,515).

Applicant claims an alcohol composition which comprises mixtures of mono alcohol, diol and triol in various weight ratios, with the di to triol weight ratio of greater than 5/1.

Early et al. substantially discloses the claimed invention, which is a polyol blend comprising a polyether triol and a diol with the weight ratio of polyether triol to diol being 1:8 to about 6:8. (see column 3, lines 72-75, & column 4 lines 1-4). Early et al. does not explicitly disclose some of the claimed limitations, which are, directed to the weight ratios of the alcohols, however, these differences appear to be well within the purview of an ordinary artisan, since Voss et al. The Voss et al. reference discloses that it may be advantageous to incorporate small amounts of low molecular weight dihydric to tetrahydric alcohols I the monoalcohols used for preparing the di and/or poly-urethanes. (see column 5, lines 16-19).

Therefore, a skilled artisan would be motivated to change the weight percentage of the alcohol blends to optimize the end polyurethane product. The product is deemed obvious to one of ordinary skill in the art since it involves a predictable and expected product and the composition has the same utility as those in the prior art.

6. Claims 26 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frankel, E. (U.S. 3,787,459) in view of Abatjoglou et al. (U.S. 4,731,486), in view of Bahrmann et al. (CA2,162,083), in view of Hanes (U.S. 4,633,021), and further in view of Early et al. (U.S. 3,674,718).

### **Applicant Claims**

Applicant claims a process for preparing an alcohol composition, where the diol to triol weight ratio is greater than 5/1, including the steps of; a) hydroformylation of unsaturated fatty acids or fatty acid esters in the presence of a organophosphine catalyst, b) separating the aldehyde product, and c) hydrogenating the aldehyde product.

### **Determination of the Scope and Content of the Prior Art (MPEP §2141.01)**

Frankel teaches a process for hydroformylation of monounsaturated fatty acid/esters compounds into aldehyde using a highly selective hydroformylation catalyst system. (see column 2, lines 21 – 25). Frankel's catalyst system uses rhodium triphenylphosphine catalyst. The formyl product obtained from the reaction is separated out by distillation. (see column 7, lines 10 – 14). Frankel discloses that when safflower oil esters are used the end product consist of a mixture of monoformyl stearate and diformyl stearate (see Example 22). Also, Frankel's Example 20, Table V, discloses a hydroformylated product yield for monoformyl of 38.1 to 12.4 and di and triformyl ester of 50.0 to 85.4 depending on the run time of the reaction.

### **Ascertainment of the Difference Between the Scope of the Prior Art and the Claims (MPEP §2141.012) & Obviousness Rational (MPEP §2142-2143)**

Frankel lacks the express teaching of the hydroformylation reaction: i) use of monosulfonated tertiary organiphosphine and derivatives thereof; ii) using greater than about 80% weight percent of the fatty acid/ester compounds; iii) reaction temperature of greater than 45°C and less than 200°C or greater than 50°C and less than 250°C; and

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iv) reaction pressure greater than 1 psia and less than 10,000 psia or 50 psia to 1,000 psia. Further, Frankel does not disclose that the formyl product is extracted, nor that formyl product is hydrogenated with is Raney nickel or supported nickel catalyst to obtain an alcohol composition. Lastly, Frankel lacks the express teaching of an alcohol composition which comprises mixtures of mono alcohol, diol and triol in various weight ratios, with the di to triol weight ratio of greater than 5/1.

However, with regard to i) above, Abatjoglou et al. discloses the use of monosulfonated tertiary phosphine metal salt ligands as the phosphorus ligand in non-aqueous Group VIII transition metal-phosphorus complex catalyst in a hydroformylation reaction that produces an aldehyde (formyl). (see column 2, lines 67-68; & column 3, lines 1-4). Further, Abatjoglou et al. discloses that the use of the particular monosulfonated tertiary phosphine metal salt ligands catalyst allow for normal and iso chain aldehyde product ratio selectivity by varying the metal cation group of the ligands in addition to varying the carbon monoxide partial pressure. This in turn allows for target yield of whichever particular aldehyde product ratio desired. (see column 3, lines 58-68, & column 4, line 1).

With regard to iii) and iv) above, Abatjoglou et al. discloses temperature and pressure ranges that essentially are identical to those of applicants. (see column 28, lines 17-49).

With regard to extracting the formyl product, Hanes discloses a method of extracting the aldehyde product from the hydroformylation reaction mixture. (see column 1, lines 65 – 68 & column 2, lines 1 – 2).

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With regard to hydrogenating of the aldehyde produced from hydroformylation of step (a) of claim 26, Abatjoglon discloses that aldehyde products of the hydroformylation process are especially useful as starting material for the production of alcohols. (see column 28, lines 50 – 54). Further, Bahrmann et al. discloses hydrogenation of the hydroformylation product using Raney nickel. With regard to hydrogenation catalyst metals being from Groups I (potassium) and II (magnesium), it is well known in the art that these metals reducing agents for aldehydes. (Ullmann's encyclopedia of Industrial Chemistry 7<sup>th</sup> edition, Aldehydes, Aliphatic and Aromatic, sect. 2.2 pp 6-7).

With regard to ii) above, and the express teaching that Applicant's alcohol composition produced that comprises mixtures of mono alcohol, diol and triol in various weight ratios, with the di to triol weight ratio of greater than 5/1, these results are within the teaching of the art since Bahrmann discloses the production of the hydroformylated product of aldehyde which is then reacted to form the corresponding alcohols. Further, Early et al. discloses that in the preparation of polyurethane foam a polyol blend is employed comprising a polyether triol and a diol with the weight ratio of polyether triol to diol being 1:8 to about 6:8. (see column 3, lines 72-75, & column 4 lines 1-4). Claims are rejected under 35 U.S.C. 103 since claimed invention is prima facie obvious over prior patent whose process is similar and where applicant's claimed range in starting material touches that in the typical preferred range of reference inasmuch as applicant has not rebutted this prima facie case by establishing existence of unexpected

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properties in range claimed or by showing that the art in any material respect taught away from use of claimed range. In re MALAGARI, 182 USPQ 549 (C.C.P.A. 1974)

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare an aldehyde composition as suggested by Frankel, E. (U.S. 3,787,459) in view Abatjoglou et al. then hydrogenate the aldehyde product as suggested by Bahrmann to produce an alcohol composition comprising a mixture of hydroxymethyl-substituted fatty acids or fatty acid esters comprising mixtures of mono alcohol, diol and triol in various ratios, with the di to triol weight ratio of greater than 5/1, as suggested by Frankel, E. (U.S. 3,787,459) in view Early et al., to produce an alcohol blend useful in the production of polyurethane. Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, 82 USPQ2d 1385 (U.S. 2007).

7. Claims 18 and 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Early et al. (U.S. 3,674,718), in view of Voss et al. (U.S. 4,189,515), in view of Frankel, E. (U.S. 3,787,459) in view of Abatjoglou et al. (U.S. 4,731,486), and in view of Bahrmann et al. (CA2,162,083),

Applicant claims an alcohol composition and the process of making the alcohol composition. See brief description in paragraphs 4 and 5 above.



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The combination of Early et al. and Voss substantially disclose the claimed composition. Also, Frankel, Abatjoglou et al. and Bahrmann et al. substantially disclose the process of making the alcohol composition of the claimed invention. See description of the references in paragraphs 4 and 5 above.

For the reasons set forth above in paragraphs 4 and 5, It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to prepare an aldehyde composition as suggested by Frankel, E. (U.S. 3,787,459) in view Abatjoglou et al. then hydrogenate the aldehyde product as suggested by Bahrmann to produce an alcohol composition comprising a mixture of hydroxymethyl-substituted fatty acids or fatty acid esters comprising mixtures of mono alcohol, diol and triol in various ratios, with the di to triol weight ratio of greater than 5/1, as suggested by Frankel, E. (U.S. 3,787,459) in view Early et al., to produce an alcohol blend useful in the production of polyurethane. Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, 82 USPQ2d 1385 (U.S. 2007).

### ***Conclusion.***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yate' K. Cutliff whose telephone number is (571) 272-9067. The examiner can normally be reached on M-TH 8:30 a.m. - 5:00 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on (571) 272 - 0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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